**Utah’s Climate & Inversion** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_

Directions: Take notes on Utah’s climate below

# What is climate? (In space below draw pie-chart):

# Four important factors affect our climate

## Latitude

## Elevation

## Distance from an ocean

D. Landforms

A. Rain shadow effect- why Utah is so dry- Draw a diagram explaining the rain shadow effect (or describe it in words) below:

# Water

## 85% of people in Utah live near the mountains. Why?

# How does climate affect people?

V. Explain why we get inversion in Utah

**Utah's Weather Phenomenon - The Inversion**

The temperature inversion in the Great Salt Lake area, more commonly referred to as the inversion by locals, is typically at its worst in January and February, when the air is cold, there is snow on the ground, and the wind is still.

It happens when a high-pressure system hovers over the Wasatch Mountains and compresses (pushes) cold air down upon the valley, where pollutants from automobile fumes and fireplaces are produced. When combined with these pollutants, the area fog (which forms from ice crystals in the cold air) becomes smog and takes on a brownish hue. Often the amount of pollutants in the air exceeds the EPA's (environmental protection agency) health standard.

On windless days, this mixture is denser than the warmer air layer above it and thus cannot escape. So what results is a cold layer of smog under a warmer layer of air. When this occurs, the smog crystals fall out of the air throughout the day, clinging to objects and producing radiation frost. At times, it appears to be snowing. But unlike real snow, this stuff leaves a residue. Having snow on the ground can make things worse, because the whiteness reflects heat back up into the sky, instead of absorbing it and warming the ground. A good snowstorm or strong wind is what is needed to restore the balance.

Usually the higher you go into the mountains, the colder the air, but during the temperature inversion, this is not the case. Conditions can be such that the valley is around ten degrees (Fahrenheit) and blanketed with a cream soup fog, while the mountain temperature is thirty-five degrees (Fahrenheit) with sunny skies. So an easy way to get a little relief from the smog and cold air is to drive up one of the canyons. Looking down into the valley from up above, the inversion looks like a layer of fluffy clouds.



**Two Utah Cities Named Worst Air Quality In Country By EPA**

(KUTV) Utah has earned a national award from the Environmental Protection Agency however, its not an award to be proud of.

Two cities along the Wasatch Front earned top honors as having the worst air quality in the country.

The EPA releases a daily list of cities that have the worst air and Monday, Logan topped the list, followed by Provo, Utah.

While the inversion is not new to Utah, it is putting everyone at risk not just the young, sick, and elderly.

The inversion has blanketed the valley in cold, polluted air making breathing the fresh air a bad idea. The Utah Division of Air Quality listed the particle matter index at 67.9, leaving everyone at risk for respiratory problems. By breathing the air, particles of dust, soot and pollutants are also being inhaled.

Healthcare experts say they see a dramatic increase in respiratory illness this time of year and blame it almost entirely on the inversion. Experts also say the inversion is likely making it difficult for anyone to recover from the flu or a cold and recommend decreasing time spent outdoors.

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<http://www.sltrib.com/sltrib/news/55695303-78/pollution-utah-cubic-micrograms.html.csp>

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**No sure solution in sight for Utah’s air pollution**

By Judy Fahys | The Salt Lake Tribune

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Keep holding your breath. The winter smog’s here for the weekend — and likely to choke us again once next week’s storms pass.

That seems to be the consensus of forecasters whose predictions had given northern Utahns some hope that Thursday’s rain might scrub out the air pollution that’s been building for two weeks. That hope crumbled as monitors from the Cache Valley to Tooele, through the Utah and Salt Lake basins, and even Uintah County logged "unhealthy" levels of [PM 2.5](http://www.epa.gov/airquality/particlepollution/) particulate pollution.

"I would really be surprised if it completely cleaned out today or tomorrow," Bo Call said Thursday. He oversees air monitoring for the [Utah Division of Air Quality](http://www.airquality.utah.gov/).

Call pointed out higher temperatures for the next few days could help ease the pollution buildup. So, too, could the increasing likelihood of precipitation beginning Sunday.

State climatologist Rob Gillies said there’s good reason to think another high-pressure ridge will follow soon after the next round of storminess and bring with it the associated pollution-trapping inversion. His team at the [Utah Climate Center](http://climate.usurf.usu.edu/) updated its analysis of weather patterns and found evidence suggesting that there will be another eight to 10 days of high-pollution conditions after Sunday.

"We’re going to have another inversion in February," he said.

Several northern Utah counties — Cache, Davis, Salt Lake, Utah and Weber — have already exceeded the [U.S. Environmental Protection Agency](http://www.epa.gov/)’s health standard of 35 micrograms of pollution per cubic liter of air more than a dozen times thus far this season. Box Elder has exceeded it five times and Tooele 10 times thus far. It’s a marked difference from last winter, when the state did not exceed the health-based standard at any site.

Meanwhile, the [Utah Division of Air Quality](http://www.airquality.utah.gov/) has been puzzling over the remarkably high readings in Utah County. Monitor readings for one hour there hit 147 micrograms of pollution per cubic meter of air — more than four times the EPA’s health-based standard of 35.

Plus, daily average levels remained at well above three times acceptable levels, making them the highest levels the state’s ever recorded for the area.

Call pointed out that Utah County no longer has the big industrial sources of pollution that people might associate with big emissions, like the defunct Geneva Steel plant. His educated guess: Low temperatures have allowed Utah Lake to ice over, and it’s fueling the buildup.

"That lake being frozen is like one big mirror," said Call.

In the Cache Valley, [PM 2.5](http://www.epa.gov/airquality/particlepollution/) hourly readings reached 120 on Thursday. Even without industrial sources, it’s a pollution trap, a snowy bowl that holds the dirty exhaust from cars and homes and everyday life in a cold pool.

On Tuesday, the Cache County Council signaled that it will stop fighting state and federal regulators and adopt an emissions testing program for vehicles this year.

Certain they had a better solution for their community with a proposed sticker program, they balked when the EPA and state air-quality officials insisted on the sort of emissions program already used on the Wasatch Front to bring winter smog episodes into compliance with federal law by the end of next year.

"We really thought our program would be better than theirs," said County Executive M. Lynn Lemon, noting that a threatened $50,000-a-day fine was a factor. "We’re going to move forward."

State air-quality scientists have been working on broader plans to reduce winter smog, but they are searching for even more pollution-cutting ideas because plans for Salt Lake and Utah counties still cannot meet federal standards.

Meanwhile, those emissions cuts won’t come in time to deal with this month’s pollution, since the improvements are expected to be gradual.